

Remarks

In this Response, claims 17-23, 25-28, 30-33, 36-41, and 44 have been amended; claims 45 and 46 have been added. These amendments and new claims are fully supported by the originally filed application. No new matter is added.

Claims 17-28, 30-41, 43 and 44-46 are presented for examination.

Examiner Interview

Examiner Dillon is kindly thanked for courtesies extended to undersigned representative in interview of May 5, 2010. In said interview, the rejections of claims 17, 18, 22, and 23 were discussed. The Examiner agreed that Wang et al. (U.S. Patent No. 6,834,326) (hereinafter "Wang") and Fye (U.S. Patent 5,983,024) (hereinafter "Fye") did not teach the recitations of claim 22. With respect to claims 17, 18, and 22, various interpretations of the references and claims were discussed, as were proposed amendments, but no explicit agreement was reached. The Examiner did agree to further consider remarks and amendments when presented by present response.

Rejections under 35 U.S.C. 103

In the Office Action, claims 17-28, 30-41, 43 and 44 were rejected under 35 USC 103 as being unpatentable over Wang in view of Fye.

Claim 17 recites in part, a controller configured:

- to establish a root partition on the storage medium, the root partition defining a plurality of characteristics of an array group that includes a plurality of array partitions, the plurality of characteristics to include a type of the array group or a parity rule of the array group,

- to establish an array partition on the storage medium, the array partition being one of the plurality of array partitions,

- to receive, via the network interface, a data access command multicast to the plurality of array partitions, and

- to determine that the data access command pertains to the array partition based at least in part on the plurality of characteristics.

Thus, it can be seen that the root partition and the array partition are established on the same storage medium and the controller determines that a data access

command pertains to the array partition based on characteristics defined in root partition.

In the Office Action, Wang was relied upon for the majority of the recitations of claim 17 and Fye column 2, lines 8-16 and Figure 2 was alleged to disclose “to determine that a data access command pertains to [a] partition based at least in part on the plurality of characteristics.” *Office Action*, page 7.

Figure 2 of Fye shows a PCI target agent’s configuration space header. The header includes a number of different addresses that may be associated with the target agent. The target agent can respond differently to a communication on a PCI bus based on which address is used. Thus, at best, the target agent determines, based on the address, whether the communication on the PCI bus pertains to the target agent and, if so, how it should react in response. The address cannot be interpreted as plurality of characteristics of a group of partitions. Therefore, the target agent does not determine that the access command pertains to it based on “the plurality of characteristics,” as recited in claim 17.

Claim 17 has been further amended to recite that the characteristics, defined in the root partition, “include a type of the array group, which indicates how data is distributed across the plurality of array partitions, or a parity rule of the array group.” In the Office Action, Wang, column 9, lines 32-42 was relied upon to provide the recitations of claim 23 related to the plurality of characteristics including a type of the group. This section of Wang discusses using user-supplied information in the construction of a system having different RAID levels. No rational basis is provided for modifying Wang so that this RAID level information is defined in a root partition as recited by claim 17. In Wang, knowledge of the RAID level/scheme is centralized in the RAID controllers. This is because it is the RAID controllers that make the determination of where to send the data. The recipients of the data sent by the RAID controllers have no reason to know the up-level organization (e.g., the RAID level that a particular RAID controller is implementing).

It is further noted that the combination of the teachings of Wang with Fye in the asserted manner is improper. Wang, relates to RAID controllers/switches distributing

information among network-attached storage (NAS) systems. See, e.g., Wang, column 2, lines 24-26. Fye, on the other hand, describes a computer sending information over a computer bus, i.e., a peripheral component interconnect (PCI) bus. See, e.g., Fye, abstract. In Fye, access to the shared, hardwired PCI bus is arbitrated among a number of different PCI agents physically coupled to the PCI bus. A person of ordinary skill in the art would not find teachings related to PCI bus arbitration/access at all relevant to teachings related to routing packets over a network.

Claim 17 is patentable over the cited references for at least these reasons.

Claims 18-28, 30-39, and 44 include recitations similar to at least some recitations discussed above with respect to claim 17. Accordingly, these claims are patentable for at least the reasons given above. These claims include additional points of patentability, some of which will be briefly introduced.

With respect to claim 18, the cited references fail to teach or suggest a controller configured “to establish the root partition and the array partition based at least in part on the plurality of partition commands.” In rejection of this claim, the read requests of Wang were said to be the partition commands. In discussion of the rejection of this claim in the interview, the Examiner stated, and as best understood by the undersigned representative, that “providing the root partition” could be broadly interpreted to include an action on a logical volume that results from the read request. While the undersigned disagrees with this proposed interpretation, claim 18 has been amended to clarify that the root and array partitions are established based at least in part on the partition commands. Similar amendments were also presented to claim 28.

With respect to claim 22 and as agreed upon by the Examiner in the interview, the cited references fail to teach or suggest a controller configured “to disregard the another data access command based at least in part on the response [to the another data access command].”

With respect to claim 26, the cited references fail to teach or suggest a controller configured “to calculate, based at least in part on the plurality of characteristics, which LBAs of the plurality of LBAs are associated with the array partition.” In the Office Action, column 17, lines 47-54 of Wang was said to provide this recitation. This cited

section teaches that LBAs may be in a SCSI command. This teaching is insufficient to teach or make obvious that a controller uses the characteristics, defined in the root partition, to calculate which LBAs are associated with the array partition that is co-located on the storage medium with the root partition.

With respect to claim 27, the cited references fail to teach or suggest a controller configured “to transmit ... data directly to another array partition of the plurality of array partitions based at least in part on the data access command.” In the Office Action, column 11, lines 63-67 of Wang was said to provide this recitation. This cited section teaches the alternative use of NetRAID (with multicasting) or NetSCSI. There is no discussion in this cited section or elsewhere that a storage appliance, having a storage medium with an array partition of the group of array partition, transmits data directly to another array partition based on an a data access command received from a host.

Claim 40 recites, in part, “a controller configured to transmit ... a first partition command to establish a root partition[, and] to transmit ... a plurality of characteristics of an array group, which includes a plurality of array partitions, to be stored in the root partition...”

In the Office Action, column 9, lines 13-22 and 32-42 was said to provide the above quoted recitations of claim 40. These cited sections relate to the RAID controller discovering the underlying network components and using user-supplied information to configure the network. Nowhere does it state that a RAID controller transmits a command to establish a partition and transmits information about an array group to be stored in the partition.

Claim 40 is patentable over the cited references for at least these reasons.

Claims 41 and 43 include recitations similar to at least some recitations discussed above with respect to claim 40. Accordingly, these claims are patentable for at least the reasons given above.

New Claims

Claims 45 and 46 have been added. These claims depend from claim 17 and are patentable for at least reasons similar to those given above with respect to claim 17. These claims also include additional points of patentability. For example, claim 45 recites that the “plurality of characteristics [defined by root partition] include the type [which] comprises a RAID type 0, 1, 4, or 5. For another example, claim 46 recites that the controller is further configured “to buffer data[from data access command;] to transfer, via the network interface based at least in part on the data access command, data from the array partition to a parity partition of the plurality of array partitions; and to save the buffered data in the array partition.” The cited references further fail to teach or suggest these recitations.

Conclusion

For these reasons, a Notice of Allowance, allowing claims 17-28, 30-41, 43 and 44-46, is respectfully requested. If the Examiner has any questions concerning the present paper, the Examiner is kindly requested to contact the undersigned at 503-796-2972. If any fees are due in connection with filing this paper, the Commissioner is authorized to charge Deposit Account No. 500393.

Respectfully submitted,
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